



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,174	12/31/2003	Lukas Trosman	24GA127099	5555

33727 7590 04/20/2006

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 8910
RESTON, VA 20195

EXAMINER

AWAI, ALEXANDRA F

ART UNIT	PAPER NUMBER
----------	--------------

3663

DATE MAILED: 04/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/748,174		TROSMAN ET AL.	
	Examiner		Art Unit	
	Alexandra Awai		3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-29 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-29 and 31-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/2/2006 have been fully considered but they are not in every respect persuasive. In response to the applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. The Office Action dated 11/7/2005 does not argue that any of Aoyama et al, Orii et al. or Koyama et al. teach the claimed structure by themselves, but rather that the invention is taught and motivated by the combined teachings of those primary references and the teachings of Ueda et al. The examiner has relied upon Ueda et al. not only to teach the position of particular groups of part-length rods, but also to teach the so-called "triangular orientation" (claim 1). See page 5 of the Office Action dated 11/7/2005. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Additionally, the specific limitations emphasized in the applicant's arguments are overcome by the stated scope of certain prior art as discussed in section 5 of that Office Action. That is, there need not be a variation disclosed in Orii et al. that exactly reads on the claimed features as long as the claimed features are suggested by the combined teachings of the cited references. However, it is acknowledged that although Aoyama et al. and Koyama et al. provide many relevant teachings, they do not set forth a configuration that is substantially similar to that of the claimed invention. It is noted that Applicant has not challenged the motivation to combine the references.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The reason that it is important to functionally distinguish the 3-rod group from the 2-rod group, thereby showing that they are not obvious variants of one another, is that simply duplicating a part – in this case, adding a third rod – is not considered to impart patentability to a structure where the duplication of the part results in an expected duplication of the known effect. This argument has been more clearly set forth in the present Office Action. While Applicant contends that the examiner has made unsubstantiated allegations, there is no pointed explanation of why the references supposedly fail to substantiate certain allegations (e.g., the teachings of Johansson et al.) or why the examiner's "opinions" are not valid.

2. Currently amended claims 24-29, 31 and 32, as well as previously presented claim 33 have been examined. Claims 1-23 are cancelled.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the 9x9 and 8x8 matrices must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 28, 29 and 32 are objected to because of certain minor following informalities. In particular, the phrase “two three part-length rod subsets” (claim 28) is ambiguous. The phrase “two three-rod subsets consisting of part-length rods” is clearer, and it provides more exact antecedent basis for the term “three-rod subset”, which is already subsequently recited. The phrase “and the voids filled with water is” (claims 29 and 32) might more accurately embody the disclosed invention if changed to “wherein the voids filled with water are.” Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 24-29 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orii et al., and further in view of Ueda et al. and Johansson et al.

The primary reference shows a structure that encompasses the basic inventive concept of the current application, i.e., a fuel bundle having water passages with circular or square cross-sections located either centrally or proximal to the center. In particular, Fig. 15 is identical to the elected embodiment that is described by the claimed features except that there is no distinction in the prior art between short- and intermediate-length rods, and that the rod subsets in a mirror-image long the center line between the two water passages are pairs rather than triplets. With regard to the new recitation that the rods may be arranged in one of a 10x10, 9x9 and 8x8 matrix,

it is noted that only one of the matrix types need be identified in the prior art, and that the elected embodiment is of the 10x10 matrix type. Orie et al. also teach that 10x10 and 9x9 rod matrices are established fuel assembly concepts.

Ueda et al. show that it is a well-known and advantageous expedient in the art to provide certain groupings of part-length rods, particularly a 3-rod subgroup adjacent to a water passage (39) (see Fig. 19; col. 12, lines 53-66). Applicant has not shown how the 3-rod group is functionally distinct from the 2-rod group such that it is *not* an obvious variant. As such, the inclusion of a third rod is no more than the duplication of parts with predictable and intended effects. See *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). Part-length rods serve to ensure the maintenance of the reactor shut-down margin, and having a 3-rod grouping modulates this effect in a predictable fashion. In other words, there is no unexpected result that directly depends on the specifically claimed configuration. Therefore, the skilled artisan desiring to duplicate the effect of one of the rods in a 2-rod subset in the interest of modulating the shut-down margin would be motivated to provide a 3-rod subset.

Ueda et al. also disclose a plurality of voids formed above the upper ends of the shorter, or part-length, fuel rods (Fig. 25A). Ueda et al. teach a design that places relatively shorter part-length rods (P_2) closer to the center of the fuel bundle and relatively longer part-length rods (P_1) toward the periphery of the fuel bundle (Fig. 25 B). Johansson et al. teach that the addition of part length rods lowers the pressure drop, thereby improving critical power. The number of part-length rods and the degree to which they are part-length is therefore a matter of optimization within prior art conditions or through routine experimentation (See MPEP § 2144.05 II.A). The concept of including part-length rods in a fuel assembly in order to modulate shutdown is well-

known (Ueda et al. column 12, line 65), and an optimization of a presently disclosed device is not considered patentably distinct from the original device.

It is inherent to fuel bundles including part-length rods that there may be voids at the end of the shorter rods. Claims 26, 29 and 32 are essentially reciting the absence of the portion of part-length rods that distinguishes them from full-length rods. The “void” feature is therefore structurally equivalent to the “part-length rods” feature, the object of which is to improve shutdown. As to limitations which are considered to be inherent in a reference, note the case law of *In re Ludtke*, 169 U.S.P.Q. 563; *In re Swinehart*, 169 U.S.P.Q. 226; *In re Fitzgerald*, 205 U.S.P.Q. 594; *In re Best et al.*, 195 U.S.P.Q. 430; and *In re Brown*, 173 U.S.P.Q. 685, 688. It would have been obvious to one skilled in the art at the time of the invention to combine the aforementioned teachings – e.g., by placing the 3-rod group taught by Ueda et al. in the configuration taught by Orii et al., and applying the teachings of Orii et al. with regard to intermediate-length rods in concert with the power modulation teachings provided by Johansson et al. – in order to provide the benefits that are the disclosed objects of all of the referenced prior art, particularly an improved shutdown margin, as part of an optimization of a known technology.

Conclusion

8. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

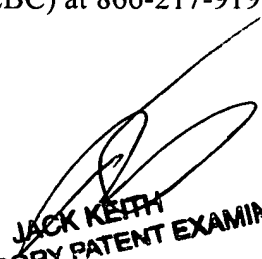
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (571) 272-3079. The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AA


JACK KEITH
SUPERVISORY PATENT EXAMINER